

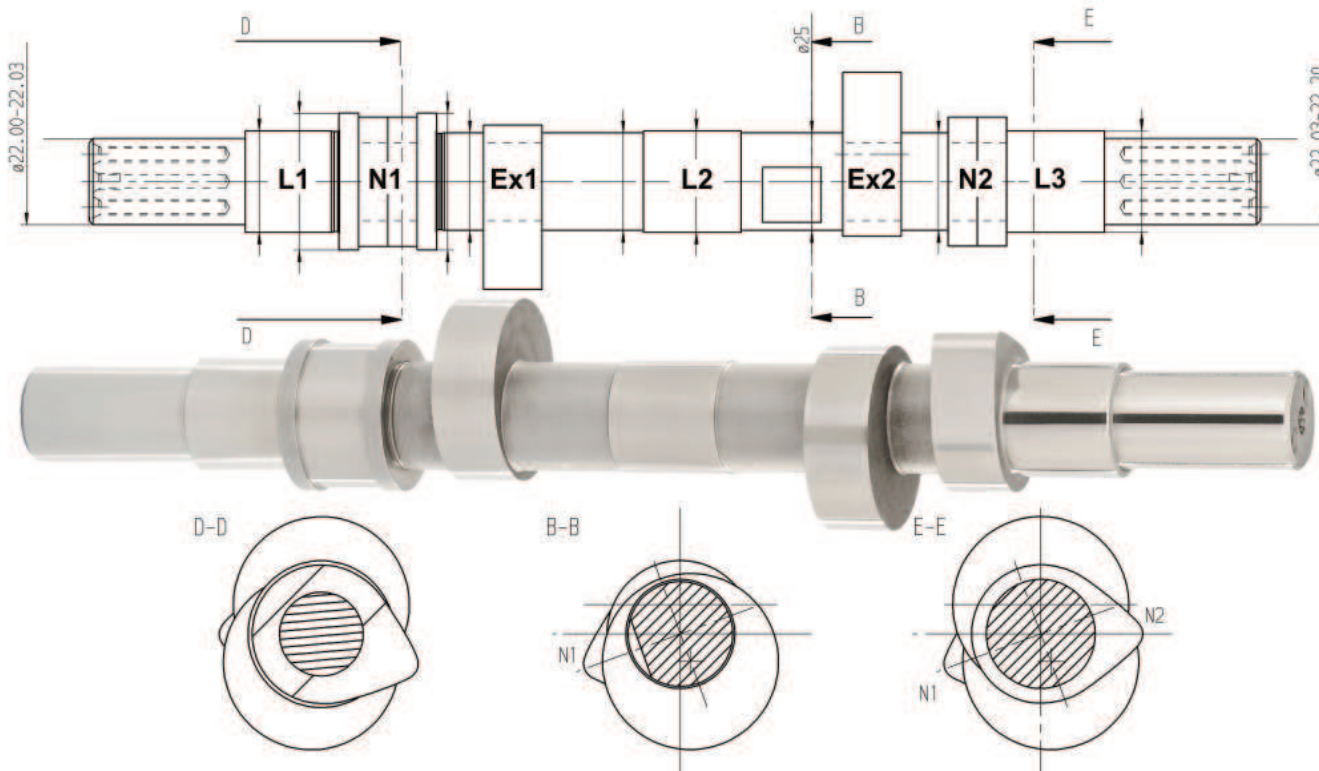
Primary Camshaft Standard

Components and Features

- three bearings L1, L2 and L3
- two eccentric circular discs Ex1 and Ex2
- two injection cams N1 and N2
- one reference face for reference to the rotary position

Characteristics

The camshaft standard is 300 mm in length and approx. 1.4 kg in weight. It is manufactured from steel.



Construction view of a camshaft standard

Calibration

The camshaft standard at PTB is calibrated on both a tactile form measuring device and a tactile coordinate measuring machine.

Testing of shaft measuring instruments

The camshaft standard is suitable for the inspection of tactile measuring instruments. It also establishes the credibility of all tests and measurements by ensuring the traceability of the measured parameters to the primary camshaft standard.

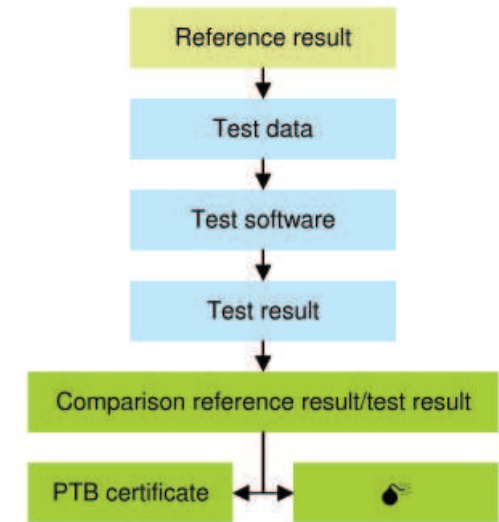
Testing of key measurands

The following are examples of measurands

- Form deviation
- Dimensional deviation

Software Verification

The software test is designed to facilitate the assessment of camshaft on the basis of test data. These data represent measurements on a camshaft. The procedure involves the evaluation of key measurands of a camshaft, such as base circle radius, camshaft stroke and form deviation. The measured data are transferred via an ASCII data format.



Principle of the software test

On the basis of the known reference parameters, the test data are generated and synthesised from the camshaft specified geometries. The generated data are processed and evaluated by the software to be verified and stored as the test result. The test results are compared with the known reference data. In general, the software is considered credible and reliable if all results are in conformance to less than 0.1 μm .

State of the Technology

As one of the most important components of a combustion engine, the camshaft is of decisive importance for a good drive quality as well as for the fuel consumption of automobiles. A deviation of the cam shape from the camshaft geometrical specifications by a few hundredths of a millimetre is liable to cause a triplication of the permitted forces.

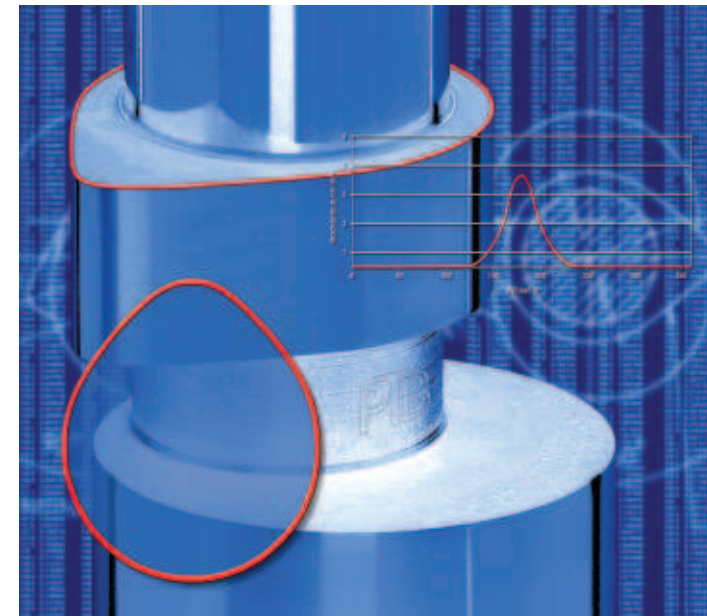
The provision of a camshaft standard allows the conditions for the measurement of camshafts to be determined and assessed in a practical-oriented and reliable way. In spite of the availability of commercial measuring instruments and software packages, up until now it has not been possible to verify the accuracy with which the tests and measurements can be performed due to the lack of traceability of the measurements to national or international standards. Therefore, the essential prerequisites for the proof of widely approved quality status are still lacking.

Furthermore, the provision of test data sets for camshaft metrology will in future allow camshaft assessment and verification of algorithms to be certified by PTB.

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Traceability of camshaft measurements
The cam standard